(2)

EEE BRANCH REVIEW

DATE: IN 7/23 OUT 8/1/75 IN ____ OUT ____ IN ____ OUT ____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 270-RRE

PETITION OR EXP. PERMIT NO. N/A

DATE DIV. RECEIVED 6/16/75

DATE OF SUBMISSION 6/9/75

DATE SUBMISSION ACCEPTED --

TYPE PRODUCT(S): I, D, H, F, N, R, S Pheromone (Insect Sex Attractant)

PRODUCT MGR. NO. 17

PRODUCT NAME(S) Farnam Muscalure (Technical Tricosene)

COMPANY NAME Farnam Companies, Inc.

SUBMISSION PURPOSE Registration of Technical Material

CHEMICAL & FORMULATION (Muscalure) Z-9- Tricosene 96.0%

FISH & WILDLIFE

100.0 Pesticidal Use

100.1,.2

- FOR MANUFACTURING USE ONLY -

This material is for use only in the manufacture of pesticides. The purchaser must obtain Environmental Protection Agency registration on the formulated product prior to shipment of such product.

Active Ingredients:
Z-9-Tricosene.....96.0%

Inert Ingredients:..... 4.0%

100.3 Packaged in 1 gallon containers.

101.0 Chemical & Physical Properties

101.1 Z-9-Tricosene

101.2 Muscamone (Muscalure)

103.0 Toxicological Properties

103.1.1 Mammal

ORGANISM	Test Type	Test Results	Test Material
Rats ♂♂ & ♀♀	Acute Oral	>23,070 mg/kg	Muscalure(?% a.i.)
Rabbits ♂♂ & ♀♀	Acute Dermal	>2,025 mg/kg	Muscalure(?% a.i.)
Rabbits	Eye & Skin Irritation	Not an irritant to eye & skin	Muscalure(?% a.i.)
Rats	Acute Aerosol Inhalation	LC_{50} = >26.6 mg/l	Muscalure(?% a.i.)

103.1.2 Bird

(1) Mallard Duck (8-Day Dietary): LC_{50} = >10,000 ppm using Muscalure(?% a.i.)

(2) Bobwhite Quail (8-Day Dietary): LC_{50} = >10,000 ppm using Muscalure (?% a.i.)

103.1.3 Fish

*(1) Rainbow Trout (Static BioAssay):

Results(LC_{50})(95% Confidence Limits)	Test Material
24-Hr LC_{50} = 100(77.9-129) ppm	Fly Bait(?% a.i.)
48-Hr LC_{50} = 92.8(70.7-122) ppm	Fly Bait(?% a.i.)
96-Hr LC_{50} = 36.5(33.1-40.3) ppm	Fly Bait(?% a.i.)
No effect level = 28 ppm	

**(2) Rainbow Trout (Static BioAssay):

Results (LC_{50})	Test Material
24 Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)
48 Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)
96 Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)

*(3) Bluegill Sunfish (Static BioAssay):

Results (LC_{50}) (95% Confidence Limits)	Test Material
24-Hr LC_{50} = 353(282-441) ppm	Fly Bait(?% a.i.)
48-Hr LC_{50} = 220(178-273) ppm	Fly Bait(?% a.i.)
96-Hr LC_{50} = 109(89-135) ppm	Fly Bait(?% a.i.)
No effect level = 65 ppm	

**(4) Bluegill Sunfish (Static BioAssay):

Results (LC_{50})	Test Material
24-Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)
48-Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)
96-Hr LC_{50} = >1000 ppm	Muscalure(?% a.i.)

*Diluent was not indicated; also, did not indicate whether vessels were aerated or not.

**Diluent was acetone; vessels were not aerated. Compound (Muscalure) appeared to be insoluble in water. A film, which was proportional to the concentration, was observed in all test vessels.

103.3 Chronic Toxicity

(1) Bobwhite Quail (One-Generation Reproduction Study):

Bobwhite quail (16 months old) were fed 2 and 20 ppm of Muscalure

(?% a.i.) in the diet for 21 weeks. No Adverse Effects were noted at either level on the reproductive success of the birds.

(2) Mallard Duck (One-Generation Reproduction Study):

Mallard duck (16 months old) were fed 2 and 20 ppm of Muscalure (?% a.i.) in the diet for 21 weeks. No Adverse Effects on reproduction nor any toxicity nor any behavioral abnormalities were noted at the 2 ppm level. No mortality occurred either. At the 20 ppm level there were no symptoms of toxicity, no behavioral abnormalities, and no mortality. However, 20 ppm caused a significant reduction in the number of hatchlings (42% hatched vs. 61% for the control birds), and, consequently, a significant reduction in the number of 14-day-old survivors per hen (72.59% survived vs. ~100% for the control birds). Between day 21 of incubation (the last interval at which the eggs were candled) and day 26 of incubation (when normal hatching should occur), a significant number of developing embryos died. These deaths caused the above two significant reductions.

104.0 Hazard Assessment

104.1 Discussion

104.1.1,.2 The toxicity data appears adequate to support the proposed use. However, to be fully acceptable, the complete chemical composition of the FLY BAIT and MUSCALURE used in the avain and fish toxicity tests must be submitted.

104.1.3 The toxicity data submitted is acceptable to support a manufacturing use. The data indicates a low order of acute toxicity to mammals and birds. However, chronically, this material causes reproductive impairment in mallard ducks at 20 ppm.

With this in mind, it should be noted that the likelihood of exposure of non-target organisms to this material would be primarily an aquatic one--i.e., through the discharge of wastes and effluent and/or by transportation spillage. Appropriate label cautions should be adequate to handle this use.

105.0 Conclusions

105.1 The avain and fish toxicity data submitted is adequate to support the proposed use. However, to be fully acceptable, the complete chemical composition of the FLY BAIT and MUSCALURE used in the

avajn and fish studies must be submitted.

105.2 Add the following caution to the product label:

"Do not contaminate water by cleaning of equipment or disposal of wastes."

Norman J. Cook
Fish & Wildlife Section
Efficacy & Ecological Effects Branch

8/1/75

...IRONMENTAL SAFETY
...DATA ABSTRACT

J W Akerman
Ecological Effects Br

Chemical (MUSCALURE) Z-9-Tricosene — 96 % a.i.

Citation FARNAM COMPANIES, INC.

Req NO. 270-RRE
EXP permit NO. N/A
Petition NO. N/A
Accession NO
Submission date 6/9/75

ORGANISM	TEST	LD_{50}	LC_{50} Dietary	LC_{50} Aquatic 24 hr	48 hr	96 hr	TEST MATERIAL
* RAINBOW TROUT	STATIC BIOASSAY	NO EFFECT LEVEL = 28 ppm; 95% confidence limits = (77.9-134)		160 ppm	92.8 ppm	36.5 ppm (33.1-40.3)	FLY BAIT (? % a.i.)
* BLUEGILL SUNFISH	STATIC BIOASSAY	NO EFFECT LEVEL = 65 ppm; 95% confidence limits = (82-441)		353 ppm	220 ppm (178-273)	109 ppm (89-135)	FLY BAIT (? % a.i.)
** RAINBOW TROUT	STATIC BIOASSAY			>1000 ppm	>1000 ppm	>1000 ppm	MUSCALURE (? % a.i.)
** BLUEGILL SUNFISH	STATIC BIOASSAY			>1000 ppm	>1000 ppm	>1000 ppm	MUSCALURE (? % a.i.)
MALLARD DUCK (14-DAY OLD)	8-DAY DIETARY STUDY		>10,000 ppm	DIELDRIN LC_{50} = 120 ppm 95% conf lim = (96-151)			MUSCALURE (? % a.i.)
BOBWHITE QUAIL (14-DAY OLD)	8-DAY DIETARY STUDY		>10,000 ppm	DIELDRIN LC_{50} = 31 ppm 95% conf lim = (24-39)			MUSCALURE (? % a.i.)
RATS ♂♂+♀♀	ACUTE ORAL	>23,070 mg/kg					MUSCALURE (? % a.i.)
RABBITS ♂♂+♀♀	ACUTE DERMAL	>2,025 mg/kg.					MUSCALURE (? % a.i.)
RABBITS	EYE & SKIN IRRITATION	NOT AN IRRITANT TO EYE OR SKIN.					MUSCALURE (? % a.i.)
RATS	ACUTE AEROSOL INHALATION	LC_{50} = > 26.6 mg/l					MUSCALURE (? % a.i.)

* Diluent not indicated; did not indicate if vessels were aerated or not.
** Acetone was used as diluent; vessels were not aerated. Compound appeared insoluble in water. A film which was proportional to the concentrations was observed in all the test vessels.

ENVIRONMENTAL SAFETY
DATA ABSTRACT

J. W. AKERMAN
ECOLOGICAL EFFECTS

Chemical (MUSCALURE) Z-9-Tricosene — 96% a.i

Citation FARNAM COMPANIES, INC.

Reg. no. 270-RRE

Exp permit N/A

Petition N/A

Submission Date 6/9/75

Accession no.

ORGANISM	DOSE	SYMPTOM/EFFECT	TEST MATERIAL
BOBWHITE QUAIL One-Generation Reproduction (21 week ~~35~~ study)	0, 2, 20 ppm	Quail (16 months old) were fed 2 & 20 ppm in diet for 21 weeks. No Adverse Effects were noted on the reproductive success of birds	MUSCALURE (? % a.i.)
MALLARD DUCK One-Generation Reproduction (21 wk study)	0, 2, " 20 ppm	Mallard ducks (16 months old) were fed 2 & 20 ppm in diet for 21 wks. Results: (1) 2 ppm caused no adverse effects.	MUSCALURE (? % a.i.)
		(2) 20 ppm caused significant reduction of number of hatchlings and, consequently, number of 14-day old survivors/hen. Between day 21 of incubation (last interval at which eggs were candled) and day 26 of incubation (when normal hatching should occur), a significant number of embryos died, thus, causing the reduced number of hatchlings.	
		(3) no other adverse effects were noted.	

MUSCAMONE

7/30/15

MUSCAMONE : Z-9-tricosene

(1) linear mono-olefin, or

(2) straight chain aliphatic hydrocarbon

AVIAN REPRODUCTIVE STUDIES

(1) Bobwhite Quail : N.E. at 2 & 20 ppm.

(2) MALLARD DUCK : Adverse effects at 2 & 20 ppm.

	MUSCALURE	MUSCAMONE
	Normal Hatchlings	Normal Hatchlings
CONTROL	61 %	68%
2 ppm	56 %	48% *
20 ppm	42 % *	51 % *
	14-DAY-OLD SURVIVORS/HEN	14-DAY-OLD SURVIVORS/HEN
CONTROL	20.8 (100%)	15.2 (100%)
2 ppm	20.0 (96%)	7.7 (50%) *
20 ppm	15.1 (73%) *	6.7 (44%) *

* Statistically significant ($p < 0.05$)

REPRODUCTIVE SUCCESS DATA

SPECIES MALLARD
CHEMICAL MUSCALURE
LABORATORY TRUSLOW FARMS
REGISTRATION 270-RRE